Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (original): A method comprising steps of:

receiving at least two space-time coded signals from an antenna system associated with a first station;

determining complex channel state information based on the received space-time coded signals; and

sending the complex channel state information to the first station.

Claim 2 (original): The method of claim 1, further comprising a step of segmenting the complex channel state information into a plurality of channel state information segments, wherein the step of sending the complex channel state information includes sending the plurality of channel state information segments in a sequence.

Claim 3 (original): The method of claim 2, wherein the step of segmenting the channel state information includes:

determining a number of phase bits allocated for phase information according to a mode of operation;

rounding and truncating a correction phase angle to fit into the number of phase bits;

determining a number of amplitude bits allocated for amplitude information according to the mode of operation; and

rounding and truncating a correction amplitude according to the number of amplitude bits.

Claim 4 (original): The method of claim 2, wherein the step of sending the plurality of channel state information segments includes sending a correction phase angle most significant bit before sending a correction amplitude most significant bit.

Claim 5 (original): The method of claim 2, wherein the step of sending the plurality of channel state information segments includes sending a correction phase angle most significant bit before sending a correction phase angle least significant bit.

Claim 6 (original): The method of claim 2, further comprising steps of:

receiving the plurality of channel state information segments;

reconstructing the complex channel state information from the received plurality of channel state information segments; and

weighting first and second feed signals to feed respective first and second antennas based on the reconstructed complex channel state information.

Claim 7 (original): The method of claim 2, wherein the step of sending includes sequentially sending the plurality of channel state information segments over a time period based on a channel coherence time.

Claim 8 (original): The method of claim 1, wherein:

the antenna system includes a multi-beam antenna array;

the step of receiving receives first and second space-time coded signals from respective first and second beams of the multi-beam antenna array; and

the step of determining determines the complex channel state information based on the received first and second space-time coded signals.

Claim 9 (original): The method of claim 8, further comprising steps of:

determining by the first station an angular power spectrum of a signal from a second station, the angular power spectrum defining first and second peaks at respective first and second angular positions; and

transmitting the first and second space-time coded signals in the respective first and second beams so that the first and second beams are pointed toward the respective first and second angular positions.

Claim 10 (original): The method of claim 1, wherein the antenna system includes a multi-beam antenna array, the method further including steps of:

transmitting the at least two space-time coded signals in respective beams of the multi-beam antenna array with a signature code encoded in each respective signal of the at least two space-time coded signals, the signature codes being substantially orthogonal so that a second station can separate and measure a channel impulse response corresponding to each space-time coded signal;

measuring the channel impulse response for each space-time coded signal at the second station, the space-time coded signals including a selected set of least attenuated signals and a remaining set of most attenuated signals; and

sending an indicia of the selected set of least attenuated signals from the second station to the first station.

Claim 11 (original): The method of claim 1, wherein:

the antenna system includes first and second diversity antennas, the first and second diversity antennas being one of first and second orthogonally polarized antennas and first and second antennas spatially separated by at least one wavelength;

the step of receiving receives first and second space-time coded signals from respective first and second diversity antennas; and

the step of determining determines the complex channel state information based on the received first and second space-time coded signals.

Claim 12 (previously presented): The method of claim 1, wherein the antenna system includes plural diversity antennas spatially separated from each other by at least one wavelength, the method further including steps of:

transmitting the at least two space-time coded signals in respective antennas of the plural diversity antennas with a signature code embedded in each respective space-time coded signal, the signature codes being substantially orthogonal so that a second station can separate and measure a channel impulse response corresponding to each space-time coded signal;

measuring the channel impulse response for each space-time coded signal at the second station, the space-time coded signals including a selected set of least attenuated signals and a remaining set of most attenuated signals; and

sending an indicia of the selected set of least attenuated signals from the second station to the first station.

Claim 13 (original): The method of claim 1, wherein the antenna system includes first and second diversity antennas, the first diversity antenna being orthogonally polarized with respect to the second diversity antenna, the method further including steps of:

transmitting first and second space-time coded signals in respective first and second diversity antennas with first and second signature codes embedded in the respective first and second space-time coded signals, the first and second signature codes being substantially orthogonal so that a second station can separate and measure a channel impulse response corresponding to each of the first and second space-time coded signals;

measuring the channel impulse response for each of the first and second space time coded signals at the second station, the first and second space-time coded signals including a least attenuated signal and a most attenuated signal; and

sending an indicia of the least attenuated signal from the second station to the first station.

Claim 14 (original): The method of claim 1, further comprising a step of transmitting the first and second space-time coded signals with first and second signature codes embedded in the respective first and second space-time coded signals, the first and second signature codes being substantially orthogonal so that a second station can separate a composite signal into the first and second space-time coded signals, wherein the step of receiving receives the first and second space-time coded signals as the composite signal at the second station.

Claim 15 (original): The method of claim 1, wherein the complex channel state information includes at least one weight, each weight including amplitude and phase angle information.

Claim 16 (original): The method of claim 1, wherein the step of determining complex channel state information includes determining a correction phase angle to adjust a first phase of a first space-time coded signal transmitted from a first antenna relative to a second phase of a second space-time coded signal transmitted from a second antenna so that the first and second space-time coded signals constructively reinforce at a second station.

Claim 17 (original): The method of claim 16, wherein the step of determining a correction phase angle includes:

measuring a first phase angle defined by the first phase;

measuring a second phase angle defined by the second phase; and

determining the correction phase angle defined to be a difference between the second phase angle and the first phase angle.

Claims 18-25 (canceled)

Claim 26 (currently amended): A system comprising a remote station, the remote station including:

a receiver to receive at least two space-time coded signals from an antenna system;

a processor to determine complex channel state information from the received space-time coded signals; and

a transmitter to send the complex channel state information to a base station,

<u>wherein the processor includes a processor module to segment the complex channel state information into a plurality of channel state information segments; and the transmitter includes circuitry to send the complex channel state information in a sequence of the channel state information segments; and wherein said processor module includes:</u>

<u>logic to determine a number of phase bits allocated for phase information according to a mode of operation;</u>

<u>logic to shorten a correction phase angle to fit into the number of phase bits;</u>

<u>logic to determine a number of amplitude bits allocated for amplitude information according to the mode of operation; and</u>

logic to shorten a correction amplitude according to the number of amplitude bits.

Claim 27 (canceled)

Claim 28 (canceled)

Claim 29 (currently amended): The system of claim ~~27~~26, wherein the transmitter's circuitry ~~to send of the transmitter~~ sends a correction phase angle most significant bit before sending a correction amplitude most significant bit.

Claim 30 (currently amended): The system of claim ~~27~~26, wherein the transmitter's circuitry ~~to send of the transmitter~~ sends a correction phase angle most significant bit before sending a correction phase angle least significant bit.

Claim 31 (currently amended): The system of claim ~~27~~26, further comprising the base station wherein:

the base station includes a receiver to receive the plurality of channel state information segments;

the base station further includes a processor to reconstruct the complex channel state information from the received plurality of channel state information segments; and

the processor of the base station includes circuitry to weight first and second feed signals to feed respective first and second antennas based on the reconstructed complex channel state information.

Claim 32 (currently amended): The system of claim ~~27~~26, wherein the circuitry of the transmitter sequentially sends the plurality of channel state information segments over a time period based on a channel coherence time.

Claim 33 (original): The system of claim 26, wherein:

the antenna system includes a multi-beam antenna array;

the receiver receives first and second space-time coded signals from respective first and second beams of the multi-beam antenna array; and

the processor determines the complex channel state information based on the received first and second space-time coded signals.

Claim 34 (original): The system of claim 33, further comprising the base station wherein the base station includes:

the multi-beam antenna array;

circuitry to determine an angular power spectrum of a signal transmitted from the remote station, the angular power spectrum defining first and second peaks at respective first and second angular positions; and

circuitry to transmit the first and second space-time coded signals in the respective first and second beams of the multi-beam antenna array so that the first and second beams are pointed toward the respective first and second angular positions.

Claim 35 (original): The system of claim 26, further comprising the base station wherein:

the base station includes the antenna system, the antenna system being a multi-beam antenna array;

the base station includes circuitry to transmit the at least two space-time coded signals in respective beams of the multi-beam antenna array with a signature code encoded in each respective signal of the at least two space-time coded signals, the signature codes being substantially orthogonal so that a remote station can separate and measure a channel impulse response corresponding to each space-time coded signal;

the remote station includes circuitry to measure the channel impulse response for each space-time coded signal at the remote station, the space-time coded signals including a selected set of least attenuated signals and a remaining set of most attenuated signals; and

the remote station transmitter sends an indicia of the selected set of least attenuated signals from the remote station to the base station.

Claim 36 (original): The system of claim 26, further comprising the base station wherein:

the base station includes the antenna system, the antenna system including first and second diversity antennas, the first and second diversity antennas being one of first and second orthogonally polarized antennas and first and second antennas spatially separated by at least one wavelength;

the receiver receives first and second space-time coded signals from respective first and second diversity antennas; and

the processor determines the complex channel state information based on the received first and second space-time coded signals.

Claim 37 (original): The system of claim 26, further comprising the base station wherein:

the base station includes the antenna system, the antenna system including plural diversity antennas spatially separated from each other by at least one wavelength;

the base station further includes circuitry to transmit the at least two space-time coded signals in respective antennas of the plural diversity antennas with a signature code embedded in each respective space-time coded signal, the signature codes being substantially orthogonal so that the remote station can separate and measure a channel impulse response corresponding to each space-time coded signal;

the remote station includes circuitry to measure the channel impulse response for each space-time coded signal at the remote station, the space-time coded signals including a selected set of least attenuated signals and a remaining set of most attenuated signals; and

the transmitter of the remote station includes circuitry to send an indicia of the selected set of least attenuated signals from the remote station to the base station.

Claim 38 (original): The system of claim 26, further comprising the base station wherein:

the base station includes the antenna system, the antenna system including first and second diversity antennas, the first diversity antenna being orthogonally polarized with respect to the second diversity antenna;

the base station further includes circuitry to transmit first and second space-time coded signals in respective first and second diversity antennas with first and second signature codes embedded in the respective first and second space-time coded signals, the first and second

signature codes being substantially orthogonal so that the remote station can separate and measure a channel impulse response corresponding to each of the first and second space-time coded signals;

the remote station includes circuitry to measure the channel impulse response for each of the first and second space-time coded signals at the remote station, the first and second space-time coded signals including a least attenuated signal and a most attenuated signal; and

the transmitter of the remote station includes circuitry to send an indicia of the least attenuated signal from the remote station to the base station.

Claim 39 (original): The system of claim 26, further comprising the base station wherein:

the base station includes the antenna system and a transmitter coupled to the antenna system, the transmitter of the base station transmitting the first and second space-time coded signals through the antenna system with first and second signature codes embedded in the respective first and second space-time coded signals, the first and second signature codes being substantially orthogonal so that the remote station can separate a composite signal into the first and second space-time coded signals; and

the receiver of the remote station includes circuitry to receive the first and second space-time coded signals as the composite signal.

Claim 40 (original): The system of claim 26, wherein the complex channel state information includes at least one weight, each weight including phase angle information.

Claim 41 (original): The system of claim 26, wherein:

the antenna system includes first and second antennas; and

the processor to determine complex channel state information includes circuitry to determine a correction phase angle to adjust a first phase of a first space-time coded signal transmitted from the first antenna relative to a second phase of a second space-time coded signal transmitted from the second antenna so that the first and second space-time coded signals constructively reinforce at the remote station.

Claim 42 (original): The system of claim 41, wherein the circuitry to determine a correction phase angle includes:

logic to measure a first phase angle defined by the first phase;

logic to measure a second phase angle defined by the second phase; and

logic to determine the correction phase angle defined to be a difference between the second phase angle and the first phase angle.

Claims 43-50 (canceled)

Claim 51 (previously presented): The method of claim 1, wherein the determining step occurs at a second station.

Claim 52 (previously presented): The method of claim 1, wherein the determining step is performed by a processor at a second station.

Claim 53 (new): The method of claim 1, further comprising the steps of:

transmitting said at least two space-time coded signals from said antenna system in at least two beams; and

using separate scaling control signals to control a power transmitted for each beam.

Claim 54 (new): The method of claim 53, wherein at least one of said scaling control signals is complex, and further comprising the steps of:

using a real component of said complex scaling control signal to scale an amplitude of said beam; and

using an imaginary component of said complex scaling control signal to shift a phase of said beam.